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OCT 23 2006

REMARKS/ARGUMENTS

Claims 2, 13, 18-20, 28, and 37 are canceled. Claims 1, 14, 31, 34, and 38-39 are amended. Claims 1, 3-12, 14-17, 21-27, 29-36, and 38-39 are pending.

The Examiner rejected Claims 1, 3-12, 14-17, 29, 30, 32, and 33 under 35 U.S.C. 103(a) as being unpatentable over Chien et al. (US 5,895,740).

Claims 1 and 14 have been amended to recite that the first deposition provides a flow of the first deposition gas from a first deposition gas source and the stops the flow of the first deposition gas, and that the second deposition is provided after the first deposition gas is stopped, which comprises providing a flow of the second deposition gas from a second deposition gas source and then stopping the flow of the second deposition gas. The Examiner agrees that this is not expressly taught by Chien. This two step process, which provides a first deposition gas, stops the first deposition gas and then provides a second deposition gas is not disclosed or suggested by Chien. Col. 5, lines 43-61, of Chien discuss how different recipes provide different deposition thicknesses, but nothing in Chien discloses or suggests an improved deposition by a two step gas flow process where one deposition gas is stopped before a second deposition gas is added. For at least these reasons, Claims 1 and 14, as amended, are not made obvious by Chien.

The Examiner rejected Claim 24 under 35 U.S.C. 103(a) as being unpatentable over Yang (US 5,296,410) in view of Moslehi (US 5,273,609). The Examiner stated that Yang and Moslehi fail to teach wherein the widths of the conductive lines are greater than the widths of the line masks, wherein the widths of the mask spaces is more than 50% greater than the widths of the spaces between the conductive lines, but that such features would be obvious in view of the cited references. It is not obvious that it would be possibly to successfully reduce the mask spaces by more than 50%. MPEP 706.02(j) states that to establish a prima facie case of obviousness three basic criteria must be met. The second criteria is a reasonable expectation of success. The Examiner failed to show this. In order to successfully provide such a reduction a multiple step deposition using alternating gases is required. Such a process is not made obvious from the cited references. For at least these reasons, Claim 24 is not anticipated or made obvious by the cited references.

The Examiner stated that claims 21-23, 25-27, 35, and 36 are allowed.

The Examiner objected to claims 31, 34, 38, and 39 as being dependent on rejected claims, but that they would be allowable if rewritten as independent claims including all limitations of the base claim and any intervening claim. Claims 31, 34, 38, and 39 have been amended accordingly.

Dependent Claims 3-12, 15-17, 29, 30, 32, and 33 are also patentably distinct from the cited references for at least the same reasons as those recited above for the independent claims, upon which they ultimately depend. These dependent claims recite additional limitations that further distinguish these dependent claims from the cited references.

For example, Claims 3 and 16 recite a third deposition with the first gas chemistry and a fourth deposition with the second gas chemistry. It would not be obvious to provide a third deposition using the first gas chemistry and a fourth deposition using the second gas chemistry. The Examiner failed to point out anything that discloses or makes obvious alternating the gas chemistry. The Examiner stated that Chien et al. discloses that the changes of ratios are a result of effective variable that affects the thickness of the deposited layer and that it would have been obvious to one of ordinary skill in the art to change the reacting gas ratio to an amount which would not be expected to significantly affect the characteristics of the deposition process, that is the claim is open to extremely small changes that would make them insignificant changes in ratios. Although it would appear that such variations are not significant, it was found that modulating the chemistry over repeatable cycles provided more vertical walls. This is not disclosed or suggested by Chien.

In addition, Claims 4 and 11 further recite that the second critical dimension is not greater than 70% of the first critical dimension. Nothing in the cited references teaches or suggests that the critical dimension could be reduced by more than 30% while maintaining uniform sidewalls. The ability to provide sufficiently conformal walls to allow such a reduction was an unexpected result. The Examiner stated that Chien et al. teaches that the thickness of the conformal layer may be controlled by changing various parameters. However, Chien does not teach or suggest that it is possible to provide a conformal layer with a thickness sufficient to reduce the critical dimension by more than 30%. The inventive process of using a first deposition gas chemistry and then a second deposition with a second gas chemistry provides a uniform sidewall deposition to reduce the CD more than 30%, which is unexpected in the prior art. As stated above, MPEP

706.02(j) states that a showing of a reasonable expectation of success needs to be made. The Examiner failed to show that the references provide a reasonable expectation of success of providing the reduction of the CD by more than 30%. In the prior art, a deposition that reduced the CD more than 30% provided non-uniform sidewalls. For at least these reasons, Claims 3-12, 15-17, 30, 32, 33, 35, and 36 are not anticipated or made obvious by the cited references.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (650) 961-8300.

Respectfully submitted,

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